Wastewater Treatment Division

Appendix B:
IT Staffing

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Westin Engineering, Inc. Project 6251

Figures

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1. IT STAFFING

1.1 Introduction

The results of the Computer Systems Planning Study are documented in this Computer Systems Master Plan, which consists of:

➢ Executive Summary
➢ Master Plan
➢ Appendix A – Cost Avoidance Benefits
➢ ***Appendix B – IT Staffing***
➢ Appendix C – IT Standards
➢ Appendix D – IT Architecture
➢ Appendix E – Existing Condition Assessment
➢ Appendix F – Projects and Subprojects

This appendix provides information and recommendations on the information technology (IT) staffing issues associated with the King County Wastewater Treatment Division (WTD), which would result from the Computer Systems Master Plan recommended projects. This appendix has three primary sections:

➢ Internal Staffing (1.3)
  This section describes the internal staffing issues associated with information technology. It focuses on how the Division might create the following organization:
  • Create a chief information officer (CIO) position to direct the planning and development of all information technology programs within the Division.
  • Organize a Core of Excellence (COE) to organize, manage and evaluate the proposed computer systems projects described in this Master Plan. This function is shown as the following staff positions in Figure B-1:
    • Program coordinator
    • DBAs
    • Project management staff
    • Technical support staff.

➢ Continuity of Services (1.4)
  This section describes the staffing issues associated with maintaining a core IT staff to insure the continuity of current computer systems and to insure ongoing support for new computer system projects and subprojects as they come online. This function is shown as "O & M Staff" support in Figure B-1 and is staffed by resources responsible for specific computer systems in each of the Sections.

➢ External Staffing Sources (1.5)
  This section describes the issues associated with utilizing external resources to supplement Division resources to manage complex technical issues and to satisfy project-induced spikes in

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staffing resource requirements. This function is shown as "Outsourced Staff" support in Figure B-1 and is staffed by resources responsible for specific contracted computer system development or maintenance services in each of the Sections.

1.2 Staffing Recommendation

Sections 1.3 through 1.5 present an approach for managing this program that addresses the staffing needs for the three types of support required:
➢ Internal Staffing (1.2)
➢ Continuity of Services (1.3).
➢ External Staffing Sources (1.4)

To implement the program recommendations, WTD must create a CIO position and an organization to support the management of four staffing areas:
1. Program/project management staff
2. Technical staff
3. System operations and maintenance staff
4. External staffing sources.

To make this happen, the following key positions must either be filled from existing staff or be hired.
➢ Division chief information officer (CIO)—1 new hire
➢ Division COE program coordinator—current staff
➢ Database administrator—2 new hires

Job descriptions for these key positions are provided in Section 1.6.

It should be noted that much of the impact on staffing for the Division as a whole would occur as a result of each individual project being implemented. These staffing implications are provided on a project-by-project basis in Appendix F: Projects and Subprojects, in which the WTD labor cost is identified for each of seven phases of work for each subproject.

In order for this the Computer Systems Master Plan Program (the Program) to be a success, its nine improvement projects and any other WTD projects that have significant IT components need to be managed as a whole. A common set of standards, implementation guidelines and system architecture must be applied to all projects and subprojects that make up the Program. The staffing plan and implementation strategies that follow summarize Westin's recommendations on how to organize and conduct the Program.

The key to success of the recommended approach is for WTD to take immediate action and implement the following two recommendations:
➢ Hire a chief information officer who reports directly to the WTD division manager and participates in WTD business decision making at the Section manager level.
➢ Establish a Core of Excellence group, reporting to the CIO, which coordinates the activities of all the technology projects included in this Program, plus the technology components of the other WTD projects funded outside of this Program.

The funding for the COE and supporting matrix personnel is included in each of the nine projects and 29 subprojects that make up this Program. Appendix F identifies these funds at the subproject level for each of the seven project phases WTD uses in estimating the cost of projects included in its Capital Improvement Program:

1. Planning
2. Pre-design
3. Final design
4. Implementation

   - Construct
   - Other
5. Close out
6. Land acquisition
7. Contingency.

Figure B-1 illustrates the relationship between the CIO and the COE and how they provide support to the Sections by using matrix personnel to implement the projects.
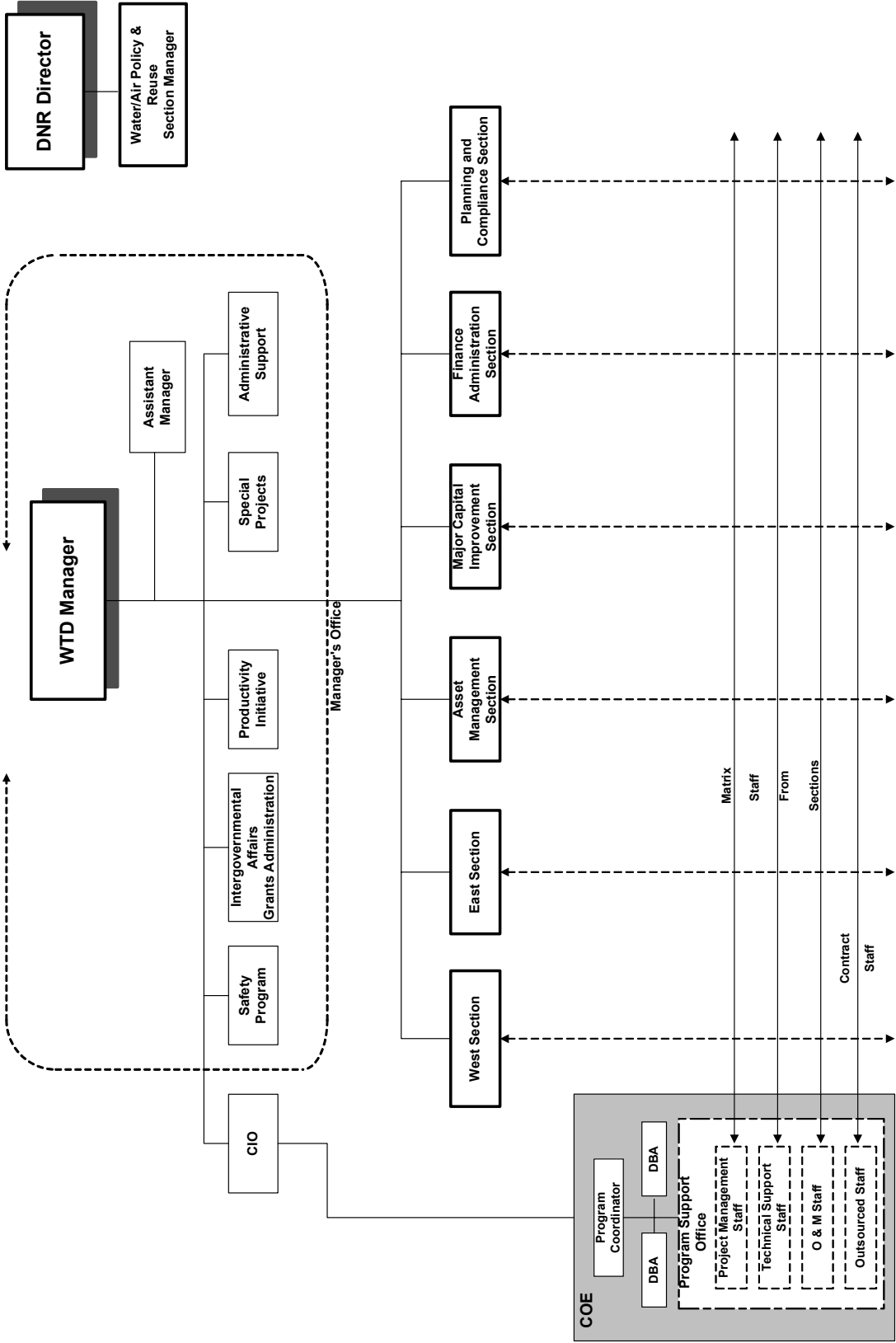
Organization Chart

DNR Director

Water/Air Policy & Reuse Section Manager

WTD Manager

Assistant Manager

- Safety Program
- Intergovernmental Affairs Grants Administration
- Productivity Initiative
- Special Projects
- Administrative Support

Manager's Office

CIO

- West Section
- East Section
- Asset Management Section
- Major Capital Improvement Section
- Finance Administration Section
- Planning and Compliance Section

Matrix Staff From Sections

Contract Staff

COE

Program Coordinator

DBA — DBA

Program Support Office

- Project Management Staff
- Technical Support Staff
- O & M Staff
- Outsourced Staff

Figure B-1: Program Organization – Core of Excellence (COE)

WTD Chief Information Officer (CIO)

COE

Program Coordinator & DBA's

Program Support Office (Matrix Staff)

Program Manager, Project Managers, Architects, Inter-Project Coordination, Implementation Planning, Integration Support, Change Management

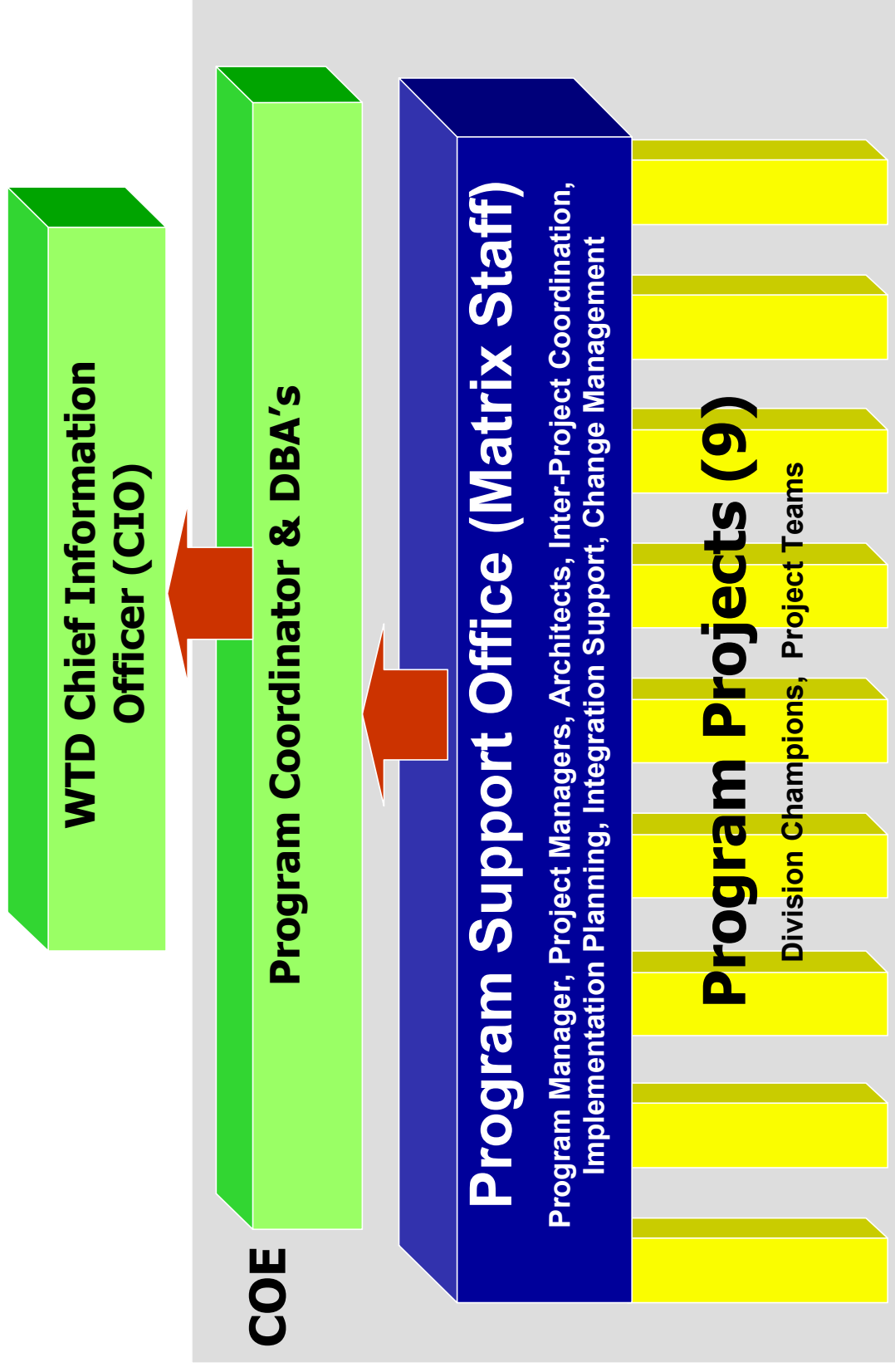**Program Projects (9)**

Division Champions, Project Teams

Figure B-2: Program Implementation Strategy

1.2.1 Implementation Strategy

Once WTD has organized for staffing the program, the next step is to embark on its implementation. Since there are 29 subprojects in the program spread out over the 10-year planning period, there will be ample opportunity to build implementation teams that are reassigned to multiple projects over the programs duration. By using the COE staffing approach, WTD can create a number matrix project teams to address the needs of the current calendar year projects, then increase or decrease the number of teams and their size accordingly each year. In this manner, WTD will be able to handle multiple projects using staff assigned from the Sections, but following the COE guidelines for implementation. WTD standards will be enforced, and the lessons learned from one project to another will be retained. WTD's technology expertise will grow gradually, and the matrix implementation staff will ultimately become very experienced and knowledgeable users.

Figure B-2 illustrates the program implementation strategy envisioned, which matches the implementation requirements of the Program Roadmap shown on Figure 2-1 in the Master Plan.

1.3 Internal Staffing

Historically, organizations have vacillated between centralized and decentralized structures for IT staffing. The cycle of reorganizing and restructuring IT staffs has traditionally involved the transfer of control of IT personnel. With each reorganization or restructuring, an associated amount of inefficiency and confusion occurs, resulting in reduced productivity. An IT organization structure should be focused on providing a strategy and environment that facilitates the growth of people by giving them the opportunity to do their best work, while at the same time supporting the IT requirements of the organization.

The projects identified in this Master Plan could substantially benefit from a IT staffing approach that guaranteed that a small core staff of IT professionals was applied to each project in a consistent and supportive manner. This approach would insure that key skills were available to each project on a consistent basis, that lessons learned on one project were efficiently transferred to later projects, and that staff training was optimized and comprehensive.

The concept of a Core of Excellence is designed to help organizations learn from their positive experiences and avoid repeating problematic experiences. It is also designed to provide an environment where staff can experience a consistent, focused strategy without the constant turmoil of reorganization and restructuring. The COE model concentrates on the acquisition and development of the skill sets required to foster the distinctive competencies that are needed by an organization.

Lack of focus on the development of people has caused many organizations to perform poorly in their ability to serve the needs of customers (external and/or internal).

The COE model provides a framework for creating an environment that allows organizations to address the imperatives for success during a period of rapid change. This environment not only fosters superior customer support for existing systems (both newer and older, legacy systems) but also provides increased coaching and training to the people who maintain and work with these systems.

The COE model is especially well suited to the needs of WTD's staffing needs as defined in this Master Plan. The large number of projects and subprojects being considered will all have a common requirement for core IT skills associated with the following IT activities:

➢ Computer systems infrastructure
➢ Networking infrastructure
➢ Database design and usage
➢ Requirements definition
➢ Systems selection and implementation management.

The Division could substantially benefit from the formation of a COE with the following characteristics.
➢ It would be a small, focused, working group of IT staff with a logical grouping of related skills or disciplines. In this instance, the group would focus on the five skills listed above.
➢ It would function as a technical entity focused on the development of people and the skills needed to support the proposed projects and subprojects. It would not be another mainstream production unit within the Division, but rather a technical support group.
➢ It would be an organization where individuals learn skills and share knowledge across functional boundaries. In this instance, the individuals would share their knowledge with staff in the field or at plant facilities.
➢ It could be a physical organization unit in which people are located together, or a virtual unit that is only a learning and communications vehicle. In this instance, it is envisioned as a team of individuals housed at the Division's headquarters, but working on any given day at other Division facilities throughout the County, based on project and subproject needs.
➢ It would match resources to demand based on the technical requirements of the projects and subprojects.

The mission of the COE would be to place well-trained and experienced technical staff resources where they are needed most by the business to succeed on projects. As envisioned, the Division will ensure that the individuals working in the COE continue to be trained appropriately to maintain and support the new systems, databases, and networks that the Division intends to implement as a result of this Master Plan.

The initial organization of the COE is illustrated in Figure B-1.

1.4 Continuity of Service

The Division already has a number of individuals at each major facility who are currently relied upon to provide substantial computer and networking support. This needs to be fully acknowl-

edged so that training and position plans can take into account the critical nature of the work they are doing to keep Division computer systems up and running properly. A key aspect to their proper training and development will be the formation of a COE.

1.5 External Staffing Sources

Going forward, the Division needs to sharply delineate the technical IT skill sets that it must develop and retain in-house and the skill sets that it must obtain or outsource from outside organizations. The individuals who are responsible for the ongoing maintenance and support of implemented systems must have skill sets appropriate to those tasks and must be dedicated on a full-time basis to completing those tasks. These individuals may not have adequate skill sets required to develop, implement or integrate systems. The tasks requiring the following skill sets are candidates to be outsourced:
➢ Planning
➢ Design
➢ System configuration
➢ Implementation
➢ Testing
➢ Integration.

Without this important division of labor, the Division should not expect to achieve the Return on Assets (ROA) normally associated with the kinds of computer and networking systems that it is implementing.

There are a number of good tactical reasons for outsourcing some technical services:
➢ Reduce or control operating costs
➢ Acquire key skills that are in high demand and difficult to recruit
➢ Supplement existing skills to meet peak demand requirements
➢ Fill short-term gaps in technical resources
➢ Avoid resource contention between projects on overlapping schedules
➢ Fill specialized skills requirements that may be of short duration
➢ Provide opportunities for skill transfer from external to internal staff resources.

There are also a number of good strategic reasons for outsourcing:
➢ Improve business focus (that is, stay in the business you are in, which is not computer systems or technology services for a wastewater utility)
➢ Gain access to world-class capabilities
➢ Accelerate completion of implementation and realization of benefits
➢ Share risks
➢ Free resources for other purposes.

1.6 Job Descriptions

These are the key job descriptions for the proposed positions.

Position: Division Chief Information Officer (CIO)

Nature of work
Professional administrative and technology work: establishes short-term and long-term information technology goals and objectives; directs planning, pre-design, design, and implementation programs to respond to the Division's information management needs and to protect its information assets.

Responsible for:
➢ Creating WTD's vision of the future in the use of information technology and establishing the standards, guidelines, policies and procedures that will ensure that the vision is achieved.
➢ Interfacing directly with the County's Information and Telecommunications Services (ITS) Division and Department of Natural Resources and Parks (DNRP) IT organizations and participating in policy decisions that will affect WTD information technology programs.
➢ Creating a Core of Excellence and managing its staff via the COE's program coordinator.

This position reports to the WTD division manager and work is evaluated based on quality of results obtained, productivity program measurements, conferences, and feedback from users

Examples of work
➢ Creates the Division's information technology vision and keeps it aligned with WTD business goals and objectives.
➢ Participates actively at the Section manager level in all technology decisions, and contributes to changes in business practices via use of enabling technologies.
➢ Establishes policies and procedures relative to computer training, computing assets, computing facilities management, purchasing of software and professional services (including but not limited to requests for proposal, requests for information, and the competitive bid process), and other internal computer systems support functions.
➢ Provides direction to the COE program coordinator and computer systems technical staff (including internal Division staff, contracted staff, and Department and County staff) to ensure necessary technical information is provided in a timely fashion and to avoid delays.
➢ Participates in the negotiation of contract terms and conditions; reviews and monitors all contracts for computer systems and computing technology.
➢ Supports the analysis of expenditures for computing services and technology to determine appropriate accounts for posting and ensures the adherence to budget, making appropriate adjustments to budget plans as required.
➢ Directs the activities associated with the updating of computer systems strategic plans, including the activities of internal staff and contracted consultants.
➢ Directs the preparation, maintenance, and reporting of Division records related to audits and budgets.
➢ Directs the research and advisory activities of consultants regarding cost-effective alternatives for the acquisitions of equipment, software and services.
➢ Performs related duties as required.

Required knowledge, skills and abilities
➢ Ability to communicate complex technology concepts in clear business terms at the Division level and lead technologists in fulfilling the Division's mission.

- ➢ Considerable knowledge of applicable contracts, laws and ordinances as they pertain to computer equipment, software, and services.
- ➢ Considerable knowledge of accounting, purchasing, and financial practices, including laws pertaining to contracts and contract compliance.
- ➢ Knowledge of the business of running a central computing services team.
- ➢ Knowledge of the functions, organization and administration of governmental organizations.
- ➢ Knowledge and experience with automated accounting systems.
- ➢ Ability to formulate and analyze financial information, prepare detailed reports, and present material to the Division management team.
- ➢ Ability to analyze and apply contract requirements as they relate to acquisition of computer systems goods and services.
- ➢ Ability to communicate effectively both verbally and in writing.
- ➢ Ability to establish and maintain effective working relationships with Section managers and supervisors, Division executives, Departmental management, County information systems management, outside agencies and the public.

Minimum entrance requirements
Bachelor's degree in business with a concentration in management information systems or closely related field; and 10 years experience in information technologies management; or any equivalent combination of experience and education.

Position: Division COE Program Coordinator

Nature of work
Professional administrative work: coordinates activities that support the internal workings of the Division's computer systems technical staff.

An employee in this position is responsible for coordinating activities that may relate to issues including computing assets, systems access, disaster recovery, support, training, software licensing. These are supporting activities that enable the Division's computer systems technical staff to work effectively on a daily basis.

This position reports to a member of the WTD management team (a Section manager or supervisor) and work is evaluated based on quality of results obtained, conferences, and feedback from customers.

Examples of work
- ➢ Coordinates activities that may relate to training, computing assets, computing facilities management, purchasing of software and professional services (including but not limited to requests for proposal, requests for information, and the competitive bid process), and other internal computer systems support functions.
- ➢ Coordinates with computer systems technical staff (including internal Division staff, contracted staff, and Department and County staff) to ensure necessary technical information is provided in a timely fashion and to avoid delays.
- ➢ Supports the CIO in the negotiation of contract terms and conditions, and review and monitoring of contracts for computer systems and computing technology.

➢ Supports the CIO in the analysis of expenditures for computing services and technology to determine appropriate accounts for posting and ensures the adherence to budget, making appropriate adjustments to budget plans as required.
➢ Coordinates the activities associated with the updating of computer systems strategic plans, including the activities of internal staff and contracted consultants.
➢ Assists with the preparation, maintenance, and reporting of Division records related to audits and budgets.
➢ Coordinates the research and advisory activities of consultants regarding cost-effective alternatives for the acquisitions of equipment, software and services.
➢ Performs related duties as required.

Required knowledge, skills and abilities
➢ Considerable knowledge of applicable contracts, laws and ordinances as they pertain to computer equipment, software, and services.
➢ Considerable knowledge of accounting, purchasing, and financial practices, including laws pertaining to contracts and contract compliance.
➢ Knowledge of the business of running a central computing services team.
➢ Knowledge of the functions, organization and administration of governmental organizations.
➢ Knowledge and experience with automated accounting systems.
➢ Ability to formulate and analyze financial information, prepare detailed reports, and present material to the Division management team.
➢ Ability to analyze and apply contract requirements as they relate to acquisition of computer systems goods and services.
➢ Ability to communicate effectively both verbally and in writing.
➢ Ability to establish and maintain effective working relationships with Section managers and supervisors, Division executives, Departmental management, County information systems management, outside agencies and the public.

Minimum entrance requirements
Bachelor's degree in business with a concentration in management information systems or closely related field; and three years of experience in computing infrastructure support; or any equivalent combination of experience and education.

Position: Database Administrator

Nature of work

Technical work related to the analysis, design, and implementation of database information in-
cluding logical and physical database modeling, definition, and maintenance. Work in this area
involves the use of database software packages, CASE tools, and other data modeling software
tools.

This position reports to a Division Section manager or supervisor and work is evaluated based on
quality of results obtained, conferences, and feedback from Division customers. The activities of
this position will also be managed by the Division computer systems coordinator.

Examples of work
➢ Ensures sound physical data models supporting application requirements.
➢ Maintains efficiency, integrity, consistency, and security of database objects.
➢ Monitors database schema performance and storage management.
➢ Performs planning, design and implementation of data structures use by database applica-
   tions.
➢ Analyzes and participates in the security and data integrity controls for all of the computer-
   ized database resources.
➢ Assists with technical training of users of database management systems.
➢ Participates in the analysis and definition of technical standards relating to database re-
   sources.
➢ Participates in the analysis and design function for new and existing systems to ensure adher-
   ence to technical standards, data standards, and integration with other data resources.
➢ Participates in quality audits of database systems to ensure consistency throughout the Divi-
   sion.
➢ Keeps professional skills updated and consistent with current database and information sys-
   tems technology.
➢ Communicates clearly and concisely both verbally and in writing.
➢ Writes technical reports and manuals.
➢ Establishes and maintains effective working relationships at all levels.
➢ Performs related work as required.

Required knowledge, skills and abilities
➢ Thorough knowledge of data modeling techniques.
➢ Experience with monitoring and auditing procedures of databases.
➢ Extensive knowledge of computer capabilities, limitations, and system development tech-
   niques.
➢ Knowledge and experience in the enforcement of referential integrity using foreign keys and
   primary keys.
➢ Use of entity-relationship diagrams to design the physical database model.
➢ Experience in optimizing single- and multi-table queries through the correct use of indexes.
➢ Experience in the use of middleware standards.
➢ An ability to use database monitoring tools to tune performance of database schema's data.
➢ A thorough understanding of storage efficiency for database objects.

➢ Experience in performing quality assurance and tuning of database manipulation language (DML).

➢ Ability to use Systems Design Methodology tools to create an efficient physical database design from a logical design.

➢ Ability to write efficient SQL statements through the correct use of the SQL language.

➢ Experience in creating and maintaining a database data dictionary by creating and maintaining tables, views, indexes, and sequences through the use of database definition language (DDL).

➢ Experience in using database performance tools.

➢ A working knowledge of the NT operating system.

➢ An understanding of web/client/server architecture and standards.

Minimum entrance requirements

Bachelor's degree in computer science, engineering, or statistics, or closely related field; and two years of experience in database administration; or any equivalent combination of education and experience.